2009

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Forensic Science: Scientific Evidence and Prosecutorial Misconduct in the Duke Lacrosse Rape Case

Paul Giannelli*

The need for pretrial discovery in criminal cases is critical.¹ An advisory note to the federal discovery rule states: "[i]t is difficult to test expert testimony at trial without advance notice and preparation."² A defendant's right to confrontation, effective assistance of counsel, and due process often turns on pretrial disclosure. This essay discusses a case that demonstrates this point.

What came to be known as the "Duke Lacrosse Case" began with a student party and a false accusation of rape.³ On March 14, 2006, Crystal Mangum claimed that she had been sexually assaulted at the party. As is common in rape cases, a Sexual Assault Nurse Examiner (SANE) used what is known as a "rape kit" to collect evidence. Because Mangum said that she had been vaginally, rectally, and orally penetrated without a condom and at least one of the perpetrators had ejaculated, the nurse, Tara Levicy, obtained cheek scrapings, oral swabs, vaginal swabs, rectal swabs, and pubic hair combings at Duke Hospital Emergency Room. Levicy, a trainee, also took items of clothing, including a pair of white panties. In addition, she noted that Mangum's conduct was consistent with sexual victimization. Dr. Julie

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Manly, the examining physician, found vaginal swelling ("diffuse edema of the vaginal walls"), an ambiguous finding. Mangum also told authorities she last had sex a week before the incident.

On March 16, 2006, the Durham police executed a search warrant at 610 North Buchanan Boulevard, where the party occurred. The three residents, Dan Flannery, Matt Zash, and David Evans, voluntarily assisted the police, providing statements and samples for DNA testing. During this search, Scene Investigator Angela Ashby discovered (1) five false fingernails in a trash can in the bathroom where the rape allegedly occurred (three painted red and previously applied; and two unpainted and unapplied), and (2) an unpainted, unapplied false fingernail on a computer in one of the bedrooms.

Five days later, the prosecutors obtained a Nontestimonial Identification Order to compel the players to be photographed and provide DNA reference samples. The following day, all forty-six Caucasian members of the team complied with the order by providing cheek (buccal) swabs.

I. The DNA Analysis

Ashby delivered the rape kit items and the buccal samples to Agent Rachel Winn at the Serology Section of the State Bureau of Investigation (SBI) laboratory. Using presumptive tests, Winn found no semen, blood, or saliva on the rape kit items. Consequently, they were not sent to the DNA Section for further testing. After Asby transported the false fingernails to SBI the next day, Winn forwarded them, along with the players' buccal samples, to Jennifer Leyn in the DNA Section, for conventional Short Tandem Repeats (STR) analysis. This procedure is also called autosomal testing because it focuses on non-sex chromosomes.

On March 30, 2006, SBI notified Michael Nifong, the district attorney, about the lack of semen, blood, and saliva on the rape kit items. Given Mangum's gang-rape story, this information should have raised red flags. During this time, Nifong was making sensational

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5 There have been three generations of DNA profiling procedures in forensic cases. The initial technique, Restriction Fragment Length Polymorphism (RFLP) analysis by gel electrophoresis, was supplanted by Polymerase Chain Reaction (PCR)-based methods involving the DQ-alpha locus and later multiple loci. These, in turn, were replaced by Short Tandem Repeats (STR), the current procedure, and the one used in the Duke lacrosse case. In addition to nuclear DNA analysis, courts have admitted evidence based on mitochondrial DNA testing. This technique is used to test bone, teeth, and hair shafts without roots, items that often contain low concentrations of degraded DNA, making nuclear DNA impractical.
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statements to the news media, and on April 4 the police conducted a flawed team photographic display.6

Subsequently, the prosecutors obtained an order transferring the forensic evidence to DNA Security, Inc. (DSI), a private firm located in Burlington, North Carolina, for more sensitive testing. The April 5 transfer request noted that "in cases without semen present, it is sometimes possible to extract useful DNA samples for comparison purposes using a technique known as Y STR. This technique isolates cells containing a Y chromosome from the entire sample, which must have been contributed by a male person. The S.B.I. laboratory is not equipped to conduct Y STR DNA analysis."7 Elimination samples from several other persons, including the victim's boyfriend, Matthew Murchison, were also sent to DSI.

After initial testing on some of the rape kit items, Dr. Brian Meehan, the DSI laboratory director, met on April 10 with Nifong, Investigator Benjamin Himan, and Sargent Mark Gottlieb. After this meeting, Nifong told an ABC reporter that the DNA testing by DSI had not yet come back, and he later told a public forum that the lack of DNA "doesn't mean nothing happened. It just means nothing was left behind."8 The state laboratory issued a report covering the autosomal DNA testing on April 10.9

After Reade Seligman and Collin Finnerty were indicted on April 17, Seligman's attorney filed a discovery motion, which included a request

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7Petition, April 5, 2006, submitted by David J. Saacks, Assistant D.A. (Disciplinary Hearing exhibit 207). Y-STR testing, can sometimes overcome the problems associated with interpreting DNA mixtures because it isolates cells containing the Y chromosome, which only males have. This can be significant if a non-sperm evidence sample is recovered - e.g., male saliva on a female victim.
8N.C. State Bar v. Nifong, Amended Findings of Fact, Conclusions of Law and Order of Disciplinary Hearing exhibit 207, para. 50 (July 31, 2007) [hereinafter Order of Discipline].
9The SBI lab reported that a white towel, found outside the bathroom, contained a sperm-fraction and non-sperm-fraction DNA mixture. David Evans was the dominant contributor, but the minor contributor did not match the profile of the accuser or any of the players. The lab also found that swabs from the bathroom floor contained semen, a sperm-fraction, and a non-sperm-fraction. Matt Zash, who shared the house and bathroom with Evans, was the dominant contributor. The lab also analyzed the fingernail extraction from the three painted nails found in the bathroom. "The DNA profile obtained from the false fingernails (Item 60) is consistent with a mixture: The predominant profile matched the DNA profile of the accuser. "The weaker profile is consistent with a mixture from multiple contributors. No Conclusion can be rendered . . . ." These items as well as others were transferred to DSI.
for all DNA test results and any exculpatory evidence. On April 21, a second meeting between Nifong, Meehan, and the police occurred. By this time, more testing had been completed. A third meeting took place on May 12. In the mean time, Nifong had won a vigorously contested primary election on May 2.

A. The DSI Laboratory Report

DSI issued a ten-page laboratory report on May 12, 2006, which revealed that three evidence specimens contained DNA consistent with the profiles of several persons who provided reference specimens. As things turned out, two of the three findings would not be important. One involved an unapplied fingernail (DSI # 15901) containing an autosomal DNA mixture that matched the DNA profile of Kevin Coleman, a player, at fourteen of fifteen loci. However, Crystal Mangum was excluded as a contributor. Moreover, this fingernail had been found in a bedroom, not in the bathroom where the crime allegedly occurred. The second analysis — of a sperm fraction from a vaginal swab (DSI # 15775) — revealed an autosomal DNA mixture consistent with Mangum's profile. The Y-STR analysis revealed a male profile consistent with that of Matthew Murchison, Mangum's boyfriend.

Unlike the first two findings, the third proved consequential. It concerned the mixture developed from the three applied false fingernails found in the bathroom (DSI # 15823), the alleged site of the rape. This testing, which included both autosomal and Y-STR analyses, revealed the presence of more than two persons' DNA fragments along with Mangum's profile. David Evans could not be ruled out as a contributor. The report read:

The probability of excluding a randomly selected individual from the mixture autosomal DNA profile is greater than 98%. David Evans cannot be excluded as a contributor to this mixture profile.

A search of all possible Y-chromosome profiles within the mixture Y-chromosome DNA profile in a database of 3,561 profiles found 14 matches. David Evans cannot be excluded as a contributor to the mixture Y-chromosome profile.

These findings had some probative value — but not much. First, the testing was not conclusive. It only put Evans in a category of persons who could have been the contributor. In a population of a million

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12 DSI May 12 Report, supra note 11, at 6. There are generally available population statistics for autosomal STR testing. In contrast, because Y-STR testing is new, large databases had yet to be created. DSI used a database compiled by Applied Biosystems, Inc., the company who provided the instrumentation for the Y-STR testing.
people, for example, twenty thousand would fall within the two percent indicated in the autosomal results. Second, assuming Evans was the contributor, the possibility of an innocent transfer existed. There was never any question that Evans used that bathroom (it was in his house) or that Mangum had been in the bathroom on the night of the incident. The trash can apparently contained items, such as facial tissues and Q-tips, that could have contained Evans’ DNA.13 Third, the presence of his and her DNA on this item did not establish sexual intercourse; the evidence was obtained from fingernails and not from the rape kit items. Finally, the fingernails were found in a trash can, suggesting that they had been intentionally discarded, and not lost during a struggle. Nevertheless, the results were the only forensic evidence that indicated that Evans and Mangum may have had physical contact in the bathroom and therefore buttressed her version of the events. These results apparently lead to Evans’ indictment on May 15, 2006.

The following significant, albeit obscure, sentence also appeared in the report:

Individual DNA profiles for non-probative evidence specimens and suspect reference specimens are being retained at DSI pending notification of the client [Nifong].14

This sentence masked the fact that powerfully exculpatory results had been obtained even before the first Meehan-Nifong meeting on April 10. After Nifong recused himself, DSI submitted an amended lab report (January 12, 2006) at the request of the Attorney General’s office. The above sentence was revised, now reading:

Individual DNA profiles for evidence specimens (item numbers 15772, 15776, 15785, 15816-15818) consistent with male profiles that did not match DNA profiles from any reference specimens and DNA profiles for reference specimens . . . were being retained at DSI pending notification from the client . . ..15

The items cited came from the rape kit. As Professor Mosteller has noted, the difference between the two reports is “striking” — the “language of the first report suggests inconsequential results; the revised report’s language speaks of significant and exculpatory conclusions.”16 In short, the defense remained in the dark, aware that testing had revealed multiple unidentified male DNA fragments in the

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13 TAYLOR & JOHNSON, supra note 3, at 221.
14 DSI May 12 Report, supra note 11, at 5 (emphasis in original).
rape kit items.

B. More Discovery Requests

After Evans' indictment on May 15, 2006, Finnerty's attorneys requested discovery of "any" DNA results. The prosecution provided Meehan's report to all the defendants and filed the following statement with the court: "The State is not aware of any additional material or information which may be exculpatory in nature with respect to the Defendant."17

At a hearing held on May 18, Judge Ronald Stephens asked if the prosecution had provided the defendants with all discovery material. Nifong replied: "I've turned over everything I have."18 Another discovery request followed on May 19, asking for, among other things, a "written statement of the meetings between Nifong and Meehan." Judge Stephens entered an order requiring that all tests and oral statements of witnesses be reduced to written form.

On August 31, the three defendants filed an Omnibus Motion to Compel Discovery — seeking, among other things, the underlying data for all DSI testing and the substance of comments made by Meehan at his three meetings with Nifong and the police. The motion specifically asked for any test findings even if those results did not match any of the defendants or other persons who had provided reference samples. Nifong told Judge W. Osmond Smith III, who had been appointed on August 18 to preside over the case, that the report was complete:

Judge Smith: "So you represent there are no other statements from Dr. Meehan?"

Mr. Nifong: "No other statements. No other statements made to me."19 Judge Smith ordered disclosure of the complete files and underlying data from SBI and DSI by October 20. On October 19, Evans' counsel faxed Nifong a proposed order reflecting Judge Smith's ruling.

II. The Underlying Data

On October 27, 2006, Nifong provided 1,844 pages of DSI's documents and materials, including tables of alleles and electropherograms, but not a complete written report or a summary of the Nifong-Meehan conversations. In short, these materials were turned over without any synopsis of their contents. Without a background in science or previous experience with DNA analysis, Brad Bannon, one of Evans' attorneys, bought a book on the subject and immersed himself in these documents. After spending between sixty to one hundred hours

17Order of Discipline, supra note 8, at 12, para. 70.
18Order of Discipline, supra note 8, at 13, para. 74.
19Order of Discipline, supra note 8, at 14-15, para. 86.
reviewing the DSI data, Bannon made several discoveries. First, he realized that there might be a contamination problem; Meehan’s DNA profile appeared in one of the tests. More importantly, Bannon found that the May 12 DSI report had omitted test results indicating the presence of multiple unidentified male DNA fragments (at least four) on rape kit items:

This information was exculpatory because it provided an alternate explanation for Mangum’s physical condition (e.g., the vaginal swelling). Furthermore, testing sensitive enough to identify these alleles would have presumably identified semen supposedly ejaculated during the alleged gang rape.

III. December 15 Hearing

Once again, the defense attorneys filed a discovery motion on December 13, 2006, detailing this information. The next hearing was two days later, at which time Nifong stated: “The first I heard of this particular situation was when I was served with these reports — this motion Wednesday of this week.”

Although the defense had not been notified in advance, Nifong called Meehan as a witness at the hearing. After a few perfunctory questions on direct examination, he turned Meehan over to the defense for cross-examination. Calling Meehan as a witness and then forgoing direct-examination, placed a tremendous burden on the defense attorneys, who had not prepared for a cross-examination. Nevertheless, they responded in exemplary fashion.

As the person who had waded through the 1,844 pages of lab data, Brad Bannon, Evans’ attorney, questioned Meehan first. Meehan proved to be an elusive witness. Although he admitted discussing all extant DNA results with Nifong at the April 10, April 21, and May 12 meetings, he also insisted that the May 12 report was not a “final” report, implying that a nonfinal report did not have to be complete. He also testified that Nifong never asked him to exclude anything from the report.

Yet, Bannon had noted that DSI was accredited by the American Society of Crime Directors/Laboratory Accreditation (ASCLD/LAB), an organization with standards on laboratory reports, including requirements for (1) an “accurate summary of significant material contained in the case notes” and (2) “interpretive information as well as examination results wherever possible.”

Bannon’s cross-examination contained the following exchange:

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20Order of Discipline, supra note 8, at 16, para. 95.
Mr. Bannon: “Do you rely on those protocols routinely to maintain your accreditation with ASCLD/LAB?”
Dr. Meehan: “Yes.”
Mr. Bannon: “I’d like to direct your attention to standards for reports. It says, No. 4, item reports shall include . . . .”
Dr. Meehan: “I’m there.”
Mr. Bannon: “Doesn’t it say, Results for each DNA test?”
Dr. Meehan: “Yes.”
Mr. Bannon: “You didn’t include the results for each DNA test in your report dated May 12; is that correct?”
Dr. Meehan: “That’s correct.”
Mr. Bannon: “So you violated this protocol of your own lab?”
Dr. Meehan: “That’s correct.”

Meehan also attempted to justify the failure to provide a full report on privacy concerns — i.e., that the profiles of unindicted players should not be disclosed to the public. He testified: “[W]e were trying to do what we thought was the right thing to do was minimize the exposure of the rest of the players. It would have meant that we produced profiles and names of all of those people.” The defense would have none of it:

Mr. Bannon: “The issue about privacy, what I would like for you to explain to me is how it would violate anyone’s privacy to report that your lab uncovered multiple male DNA characteristics on multiple rape kit items that did not match any of the people who are being prosecuted or any of the suspects that have been submitted in reference samples?”

The judge sustained an objection because Meehan had previously answered that question. While Meehan had given a response, he never really answered the question. The May 12 lab report could have provided the critical information about multiple unidentified male DNA fragments without providing the DNA profiles of all the reference samples.

Jim Cooney, Segilman’s lawyer, questioned Meehan next. He had the advantage of observing Meehan during Bannon’s cross-examination and was able to bore in on the critical issue.

Mr. Cooney: “Did your report set forth the results of all of the tests and examinations that you conducted in this case?”
Dr. Meehan: “No. It was limited to only some results.”

23 Transcript Dec. 15 Hearing, supra note 22, at 41.
24 Transcript Dec. 15 Hearing, supra note 22, at 69-70.
Mr. Cooney: “Okay. And that was an intentional limitation arrived at between you and representatives of the State of North Carolina not to report on the results of all examinations and tests that you did in this case?”

Dr. Meehan: “Yes.”25

“Bingo” was the way one book described that answer.26 In addition to the omission from the May 12 Report, the conduct of Nifong and Meehan in distributing the underlying data on October 27 without a synopsis raised further questions.

Mr. Cooney: “And in order for Reade Seligmann or Collin Finnerty or Dave Evans to have found the results of the tests that excluded, they needed to go through those six inches of paper to find them: isn’t that correct?”

Dr. Meehan: “That is correct.”

Mr. Cooney: “Because you hadn’t put them in the report; is that fair?”

Dr. Meehan: “That is fair.”27

IV. The Aftermath

This hearing proved to be the pivotal event in the criminal investigation. On December 22, 2006, Nifong dropped the forcible rape charge, but not the sexual assault or kidnapping offenses, after an investigator from his office interviewed Mangum, who now could not recall being penetrated. Remarkably, this was the first interview of the victim by anyone in the prosecutor’s office. The N.C. State Bar Grievance Committee, which had been considering ethical violations concerning Nifong’s pre-trial publicity comments since October, filed its ethics complaint against Nifong on December 28. Asking the state Attorney General, Roy Cooper, to take over the prosecution of the case, Nifong recused himself on January 12. Cooper dropped the charges on April 11 and declared the defendants “innocent.”

The Disciplinary Hearing Commission panel held its hearing on June 12-16, eventually finding that Nifong had violated numerous standards of professional conduct.28 By instructing Meehan to write a report mentioning only positive matches, Nifong knowingly disobeyed an

25 Transcript Dec. 15 Hearing, supra note 22, at 85.
26 TAYLOR & JOHNSON, supra note 3, at 311.
27 Transcript Dec. 15 Hearing, supra note 22, at 86.
28 In addition to his conduct involving the DNA, the Committee found that Nifong violated ethical rules concerning pretrial publicity. See Kenneth Williams, An Examination of the District Attorney’s Alleged Unethical Conduct, in Race to Injustice: Lesson Learned from the Duke Lacrosse Rape Case 271 (Michael L. Seigel ed., 2008).
obligation under the rules of a tribunal — i.e., discovery requirements.\textsuperscript{29} The failure to provide a complete report also violated an ethical rule that required prosecutors to disclose exculpatory evidence.\textsuperscript{30}

Other violations included (1) making false statements of material fact or law to a tribunal,\textsuperscript{31} (2) making false statements of material fact to a third person (the defense attorneys) in the course of representing a client,\textsuperscript{32} and (3) engaging in conduct involving dishonesty, fraud, deceit, or misrepresentations.\textsuperscript{33} Finally, the Committee ruled that Nifong had lied to the Grievance Committee during its investigation, another violation.\textsuperscript{34}

In addition to the disciplinary sanctions, Nifong was subsequently found in contempt by the trial judge in the case and spent a day in jail.\textsuperscript{35}

V. An Explanation?

Nifong’s motivations at different stages of the affair are sometimes difficult to fathom. Although Nifong’s political agenda is apparent, it is not clear why he did not retreat at various points during the process. He won the critical primary election on May 2 and, as the Democratic candidate, was an overwhelming favorite in the general election. Professor Mosteller speculates that Nifong might have believed that the critical information buried in the October 27 data either would not be discovered until after the general election, ten days away on November 7, or that it would never be discovered because the case would eventually be dismissed due to the suggestive and unreliable identification procedure.\textsuperscript{36} F. Lane Williamson, chair of the Disciplinary Hearing Commission panel, thought that dismissal of the criminal case was a probable outcome: “And while we don’t know, it seems reason-

\textsuperscript{29}N.C. Rev. Model Rule 3.4(c). The discovery obligations were based on the (1) nontestimonial identification statute, (2) the state discovery statute, and (3) the court’s June 22 discovery order.

\textsuperscript{30}N.C. REV. Model Rule 3.8(d).

\textsuperscript{31}N.C. REV. Model Rule 3.3(a)(1).

\textsuperscript{32}N.C. Rev. Model Rule 4.1.

\textsuperscript{33}N.C. Rev. Model Rule 3.4(c).

\textsuperscript{34}N.C. Rev. Model Rule 3.4(d).


ably clear that one would predict that at the suppression hearing in February the case would have been dismissed.  

Meehan’s motivation is somewhat obscure. One of the investigator’s notes recorded Meehan as stating that he could “possibly adjust prices because [his company] would really like to be involved in [the] case.”  

The lure of participating in a high profile case, however, does not explain why he went along with omitting critical information from his report. Perhaps Meehan wanted to establish his lab’s credentials to other prosecutors. In any event, Williamson labelled him “Dr. Obfuscation” for his testimony in the disciplinary hearings, and he was later dismissed from his company.

VI. Lessons Learned

A. Pretrial Disclosure

In Brady v. Maryland, the United States Supreme Court ruled that the prosecution was required to disclose exculpatory information to the defense but only if it is material. The Court’s definition of “materiality,” however, is stringent; the evidence must be outcome determinative. As Professor Mosteller has concluded, the Brady doctrine is ineffective in accomplishing its goal. In response to the Grievance Committee’s notification letter, Nifong argued that the omitted DNA analysis was “non-inculpatory” rather than “specifically exculpatory.” This is not an uncommon prosecutorial response. Mosteller persuasively argues that North Carolina’s “open file” discovery statute is far more effective than Brady in ensuring a fair trial.

There is little question that comprehensive discovery is critical in scientific evidence cases, and DNA evidence is no exception. The Journal of Forensic Sciences, the official publication of the American

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38 Notes of M. Soucie, April 17, 2006, Motion to Compel Discovery, Dec. 13, 2006, Attachment 1 (Disciplinary Hearing exhibit 229).


41 Mosteller, supra note 16, at 308.

42 Disciplinary Order, supra note 8, at 18, para. 107.


Academy of Forensic Sciences, published a symposium on the ethical responsibilities of forensic scientists in 1989. One article discussed a number of questionable laboratory reporting practices, including (1) "preparation of reports containing minimal information in order not to give the 'other side' ammunition for cross-examination," (2) "reporting of findings without an interpretation on the assumption that if an interpretation is required it can be provided from the witness box," and (3) "[o]mitting some significant point from a report to trap an unsuspecting cross-examiner." All these practices undermine discovery.

In contrast, the National Academy of Sciences recommended extensive discovery in DNA cases: "All data and laboratory records generated by analysis of DNA samples should be made freely available to all parties. Such access is essential for evaluating the analysis." The recent ABA Standards on DNA Evidence also provide for full discovery. Most attorneys have neither the time nor the expertise to challenge scientific evidence. Bannon's discovery was, in one sense, inadvertent. He was not looking for the exculpatory information. Instead, he was trying to understand the DNA technique used to separate the male and female DNA on the false fingernail found in the trash can as well as the significance of a partial match of his client A. Less determined attorney would not have devoted the sixty to one hundred hours that Bannon did. Yet, overworked and underpaid public defenders should not have to search for the needle in the haystack. A laboratory report should be comprehensive, including a section specifying the limitations of the technique used in the analysis. The report should also be comprehensible to lay persons.

B. Defense Experts

If needed, the Duke defendants could have afforded to retain DNA experts. In fact, Bannon flew to Washington, D.C., to consult with a retired FBI examiner, Hal Deadman. Most criminal defendants, however,

46 National Research Council, DNA Technology in Forensic Science 146 (1992) ("The prosecutor has a strong responsibility to reveal fully to defense counsel and experts retained by the defendant all material that might be necessary in evaluating the evidence.").
47 ABA Standards for Criminal Justice, DNA Evidence, Standard 4-1 (3d ed. 2007).
are indigent. In *Ake v. Oklahoma*,\(^{49}\) the United States Supreme Court recognized a limited right to a defense expert for indigent defendants, and yet studies suggest that implementation of this right has lagged.\(^{50}\)

The National Academy of Sciences 1992 report indicated that experts will be needed in most cases: "Defense counsel must have access to adequate expert assistance, even when the admissibility of the results of analytical techniques is not in question because there is still a need to review the quality of the laboratory work and the interpretation of results."\(^{51}\) Moreover, commentators have argued, that "[a]lthough current DNA tests rely heavily on computer-automated equipment, the interpretation of the results often requires subjective judgment."\(^{52}\) Mixtures, degradation, allelic dropout, spurious peaks, and false peaks must be evaluated in interpreting some DNA electropherograms. In short, adequate representation often requires expert assistance.

**Conclusion**

The DNA evidence played a critical, perhaps determinative, role in the Duke lacrosse team case. Without this evidence, the case may have gone forward as a credibility contest ("he said, she said"). Pre-DNA serology, such as ABO typing and protein/enzyme analysis, would not have revealed the presence of multiple male DNA fragments on the rape kit items. In sum, DNA did its job. Unfortunately, Mike Nifong did not do his.

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\(^{51}\) NRC I, supra note 46, at 147, 149 ("Because of the potential power of DNA evidence, authorities must make funds available to pay for expert witnesses . . . ").